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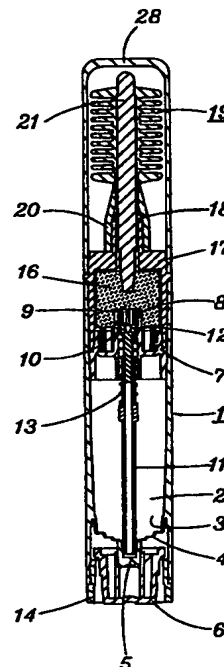
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**(54) HAIR DYEING TOOL**

(57) A hair dyeing tool including a fluid storage chamber defined within a container body and adapted to store a coating liquid therein and a coating member having a comb member disposed forwardly of the container body. The container body serves directly as the fluid storage chamber. A valve mechanism is disposed between the fluid storage chamber and the comb member, and a rear knock member is disposed backwardly of the container body so that it is actuated by the valve mechanism to eject the hair dye liquid forwardly.

**Fig. 1**



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## Description

### TECHNICAL FIELD OF THE INVENTION

[0001] The present invention relates to a hair-dye applicator or a hair dyeing tool including a fluid storage chamber defined within a container body and adapted to store a coating (hair-dye) liquid therein and a comb member disposed forwardly of the container body, wherein a valve mechanism is disposed between the fluid storage chamber and the comb member and the valve mechanism is actuated by a knock member disposed on the container body.

### BACKGROUND OF THE INVENTION

[0002] A discharging mechanism for a coating liquid to a comb member by releasing a valve of a valve mechanism is known in the art such as for example, a discharging tool disclosed in Japanese Utility Model Publication (Unexamined) No.S63-95504. In the discharging tool disclosed in this publication, a reservoir tank including a valve mechanism therein is disposed within a cylindrical member having a longitudinal axis such that the reservoir tank is slidably moved relative to the cylindrical member. A cap is attached to a rear part of the reservoir tank. By knocking or depressing the cap from the back of the cylindrical member, the reservoir tank is moved to release the valve mechanism so that a head hair cosmetic material stored in the reservoir tank is supplied to a brush.

[0003] However, the above conventional technique possesses the following problems. Since the cylindrical member and the storage tank are constituted of separate parts, a cost for the parts is increased and the working process for assembly of such component parts is increased, too. As a consequence, the cost of the final product becomes higher. Or otherwise, the cost of other parts must be reduced in order to maintain a reasonable price of the final product in the market. Reduction of the cost of other parts results in degraded performance of the final product. This is totally unacceptable, particularly as a container of cosmetic material, which is to be adhered to a human body (head hairs) and therefore taken care of from a hygienic point of view. It is very difficult to achieve the reduction of the cost of other parts without sacrifice of the performance.

### DISCLOSURE OF THE INVENTION

[0004] The present invention has been made in view of the above problems. The subject matter of the present invention resides in a hair dyeing tool (hair-dye applicator) comprising:

- a container body,
- a fluid storage chamber defined within the container body and adapted to store a coating liquid therein,

a coating member having a comb member disposed forwardly of the container body, wherein the container body is designed to serve directly as the fluid storage chamber, a valve mechanism is disposed between the fluid storage chamber and the comb member, and a rear knock member disposed backwardly of the container body is actuated by the valve mechanism so that the coating liquid is ejected forwardly.

[0005] In a preferred embodiment of the present invention, the fluid storage chamber may include a liquid reservoir portion adapted to temporarily reserve the coating liquid so that the locating liquid is ejected from the fluid storage chamber by means of actuation of the rear knock member. The coating member may be provided on a peripheral surface thereof with a plurality of the comb members.

[0006] In another embodiment of the present invention, the coating member may include a plurality of longitudinal grooves formed in a surface thereof and the coating member may include a plurality of comb members formed on a peripheral surface thereof.

[0007] It is also accepted that the coating member is allowed to extend through an interior of a basal portion of the comb member and capable of seeping the coating liquid out of a region thereof which is exposed from the comb member.

[0008] It is also accepted that the coating member is provided in such a manner as to project from the liquid reservoir portion so that the coating liquid can permeate therein rapidly.

[0009] It is also accepted that the coating member is slidably moveable back and forth within the comb member(s) by means of actuation of the valve mechanism.

[0010] It is also accepted that the coating liquid is directly permeated into the coating member from the fluid storage chamber by means of actuation of the rear knock member.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0011]

FIG. 1 is a vertical sectional view of a hair dyeing tool according to a first embodiment of the present invention;

FIG. 2 is an enlarged view of an essential portion of a hair dyeing tool shown in FIG. 1;

FIG. 3 is a view showing an outer appearance of the hair dyeing tool of the present invention shown in FIG. 1;

FIG. 4 is a top plan view of the hair dyeing tool shown in FIG. 3;

FIG. 5 is a perspective view of an essential portion of the hair dyeing tool shown in FIG. 1 but with a cap removed therefrom;

FIG. 6 is a perspective view of the essential portion;

FIG. 7 is a front view of the hair dyeing tool shown in FIG. 1 but with a cap removed therefrom;

FIG. 8 is a side view of the hair dyeing tool shown in FIG. 7;

FIG. 9 is a top plan view of the hair dyeing tool shown in FIG. 7;

FIG. 10 is a vertical sectional view of a hair dyeing tool according to a second embodiment of the present invention;

FIG. 11 is a vertical sectional view of a hair dyeing tool of a modification of the second embodiment shown in FIG. 10;

FIG. 12 is a perspective view of an essential portion of the hair dyeing tool shown in FIG. 11 but with a cap removed therefrom;

FIG. 13 is a further modified embodiment of a hair dyeing tool according to a second embodiment of the present invention;

FIG. 14 is a perspective view of an essential portion of a hair dyeing tool shown in FIG. 13 but with a cap removed therefrom; and

FIG. 15 is an enlarged vertical sectional view of an essential portion showing a hair dyeing tool according to a third embodiment of the present invention.

#### BEST MODE FOR CARRYING OUT THE INVENTION

[0012] The present invention will be described in detail hereinafter with reference to the accompanying drawings. A coating liquid (or a hair dye liquid) 2 for dyeing a head hair is directly stored in a container body 1. That is to say, the container body 1 itself serves directly as a fluid storage chamber 3. A plurality of cylindrical portions 4, which are longitudinally expansible and restorable, are steppingly formed on a rear portion (the term "rear" or "forward" refers to that side of the container body 1 where a knock cap 6 and a tail plug 14 are located, while the term "front" or "forward" refers to that side of the container body 1 where a coating member 21 and a cap 28 are located) of the container body 1 such that the cylindrical portions 4 are gradually reduced in diameter. The cylindrical portion 4, which is located at the rearmost, is formed with a bottom portion 5. Press-fitted to the cylindrical portion having the bottom portion

5 is the knock cap 6, which is larger in diameter than the above-described cylindrical portion. The knock cap 6 may be integrally formed with the container body 1 and the cylindrical portion(s) 4. By pressing the knock cap 6 with a finger, a thumb or the like, the cylindrical portions 4 can be contracted, and by releasing the pressing force against the knock cap 6, the contracted cylindrical portions 4 can be restored into their original expanded states.

[0013] The material of the container body 1 is preferably selected from transparent or translucent materials so that a remaining quantity of the coating liquid 2 can be visually recognized. However, the preferred material of the container body 1 should not be construed as being limitative to those materials. As a specific example of the material which is transparent or translucent, a homopolymer of polypropylene is desirable because it has a high transparency. However, in view of enhancement of shock resistance, such a copolymer of polypropylene as a block polymer or a random polymer, or their blend may be used. Examples of other resins may include such thermoplastic resins, which are of a transparent or translucent grade, as polyethylene, polycarbonate, polystyrene, methacrylic resin, polyphenylene-based resin, polybutadiene resin, vinyl chloride resin, polysulfone resin, polymethylpentene, polyethylene terephthalate, polyamide, polybutylene terephthalate, acrylonitrile-butadiene-styrene copolymer, acrylonitrile-styrene copolymer, fluoro-resin and the like. The above resin may be applied with a color(s) using a dye-based or pigment-based colorant to the extent that the inside state can be visually recognized. It is also accepted that a resin layer(s) of a fluorocarbon or silicon-based water-repellent oil-repellent agent is formed on an inner surface of the container body 1 (fluid storage chamber 2). This structure will enhance the visibility.

[0014] A closure member 7 is press-fitted to an inner intermediate portion of the container body 1. This closure member 7 serves as a front plug of the fluid storage chamber 3. A forwardly projecting protrusion 8 is formed on a central area of the closure member 7. A through-hole 9 is formed in the protrusion 8. A valve seat 10 is formed on an intermediate portion of the through-hole 9. A valve rod 11 is pierced into the through-hole 9. A valve portion 12, which is formed on a distal end of the valve rod 11, is in abutment with the valve seat 10. The valve rod 11 extends backwardly and a rear part of the valve rod 11 reaches the bottom portion 5 of the cylindrical portion(s) 4. The valve rod 11 is biased backwardly by a resilient member 13 such as a coil spring. In other words, the valve portion 12 is normally placed into an abutment relation with the valve seat 10 by the resilient member 13 such that the fluid 2 stored in the fluid storage chamber 3 is prohibited from flowing out through the through-hole 9.

[0015] The material of the valve portion 12 (valve rod 11) should be selected from those that can provide

a sufficient sealability to the valve mechanism. It is preferably polypropylene or a blended article of polypropylene and polyethylene obtained by ejection molding and having a lower bending modulus of elasticity than the material of the closure member 7 and having a tensile stress at breaking of 200 Kg/cm<sup>2</sup> or more (value according to the measuring method of JIS K7113).

[0016] Reference numeral 14 denotes a tail plug disposed at a rear end of the container body 1. A rear end face of the tail plug 14 is generally flush with a rear end face of the knock cap 6. A cutout 15 having a dimension just enough to put user's finger therein is formed in the rear end face of the tail plug 14 so that the knock cap 6 would not be accidentally pressed when the hair dyeing tool should be dropped, for example.

[0017] An outlet member 17 having therein a liquid reservoir member 16 is press-fitted to a front portion of the container body 1. The liquid reservoir member 16 is composed of a porous material such as urethane and fiber bundle and adapted to temporarily reserve therein the coating liquid 2 discharged from the fluid storage chamber 3 when the knock cap 6 is knocked. In order to provide a thorough sealability, the outlet member 17 may be firmly secured to the container body 1, for example, by means of bonding. A cylindrical outlet port 18 is formed in a front end face of the outlet member 17. A basal end 20 of a comb member 19 made of resin material such as polypropylene, polyacetal and nylon is press-fitted to the outlet port 18. A coating member 21 is disposed within the basal end 20 of the comb member 19. The coating member 21 extends forwardly such that a front end thereof projects (projection 21a) from the basal portion 20. On the other hand, a rear end of the coating member 21 reaches a nearby area of the front end of the valve mechanism (protrusion 8). The coating member 21 has an elongate configuration in order to facilitate the coating liquid 2 discharged from the valve mechanism to permeate into the coating member 21 rapidly. The coating member 21 is composed of intermediate cotton in the form of fiber bundle, such as polypropylene fiber, acrylic fiber, polyester fiber, nylon fiber and rayon-based fiber, a porous soft member such as polypropylene, polyethylene, ester, ether, urethane-based resin, or a hard member obtained by baking (sintering) those fibers. The coating member 21 may be of a so-called dual structure consisting of a baked hard inner member coated (or covered) with a soft member made of urethane-based resin. A plurality of grooves may be formed in a surface of the coated member 21, which is composed of the above-mentioned material, in the longitudinal direction. By forming the grooves, the surface area of the coating member can be increased and in addition, a small quantity of coating liquid can be reserved in the grooves. Accordingly, a sufficient quantity of coating fluid can be held by the coating member.

[0018] A front portion of the basal portion 20 of the comb member 19 is formed as a reduced-diameter portion 22. A plurality of window holes 23 are regularly

formed in the reduced-diameter portion 22. The total area of the window holes 23 occupies a most part of the reduced-diameter portion 22. In a sense, the reduced-diameter portion 22 is formed of a skeleton. First comb portions 25 are formed, in opposing relationship, on each of ring-shaped portions 24 formed between adjacent window holes 23. The first comb portions 25 may be formed only on one side of the ring-shaped portions 24.

[0019] The ring-shaped portions 24 are connected together through two upper and lower bridge-elements 26 of the reduced-diameter portion 22. Second comb portions 27 having the same configuration as the first comb portions 25 formed on the ring-shaped portions 24 are formed likewise in opposing relationship at intermediate portions of the bridge elements 26.

[0020] As apparent from the foregoing description, the reduced-diameter portion 22 is formed of a skeleton-like member. Accordingly, a most part of the coating member 21 is exposed from the reduced-diameter portion 22 and the coating member 21 is held by and between the ring-like portions 24 and the upper and lower bridge elements 26.

[0021] Reference numeral 28 denotes a cap, which is adapted to prevent the coating member 21 from getting dried. The cap 28 is detachably fitted to the outlet member 17.

[0022] How to use of the hair dyeing tool of the present invention will now be described.

[0023] First, the container body 1 is held in a hand and a front part of a finger is placed over the cutout portion 15 of the tail plug 14, and the knock cap 6 at the rear portion of the container body 1 is knocked or pressed with the tip area of the finger. As a consequence, the cylindrical portion(s) 4 is contracted and the bottom portion 5 presses the rear end of the valve rod 11 so that the valve rod 11 advances against the resilient force of the resilient member 13. The advancement of the valve rod 11 causes the valve portion 12 to depart from the valve seat 10 so that the valve mechanism is released.

[0024] When the valve mechanism is released, the coating liquid 2 stored in the fluid storage chamber 3 is allowed to pass through the through-hole 9 formed in the protrusion 8, then discharged into the liquid reservoir member 16 and finally supplied to the coating member 21. By this, all preparation for use of the tool is finished. In the beginning of use, it may occur that the coating liquid 2 is not thoroughly permeated into the coating member 21. So, it is desirable that the knock cap 6 is knocked several times.

[0025] Subsequently, the container body 1 is properly held again in a hand and that part of the coating member 21 which is exposed from the window holes 23 of the reduced-diameter portion 22 is placed on that part of the head hair which is to be dyed. Then, the tool is moved vertically or laterally so that the objective part of the head hair is dyed with the coating, hair dye liquid

2 oozed or seeped out of the coating member 21. Since the ring-shaped portions 24 of the reduced-diameter portion 22 is located on an outer periphery of the coating member 21 at that time, it never happens that the coating member 21 contacts directly the head skin. Thus, the head skin is prevented from getting stained.

[0026] Then, the container body 1 is turned about 90 degrees and the head hair to be dyed as well as its nearby hair are combed with the first and second comb portions 25, 27, respectively in such a manner as to spread the colored coating liquid 2. Since the bridge elements 26 are located outside the coating member 21 at that time again, it never happens that the coating liquid 2 is adhered to the head skin by the coating member 21.

[0027] In the case where a limited area of the head hair is to be locally dyed, the front projection 21a of the coating member 21 is primarily used for dyeing. Since the front end of the coating member 21 projects from the front end of the comb member 19, the projected part can be visually recognized using a mirror or the like. Thus, the desired part of the head hair can be dyed correctly.

[0028] A second embodiment of the present invention will now be described with reference to FIG. 10. In this second embodiment, a distal end of the valve rod 11 is connected to a rear end of the coating member 21 and the coating member 21 is moved back and forth by knocking the knock cap 6. The surface of the coating member 21 is slidably moved along the inner side of the reduced-diameter portion 22 every time the knock cap 6 is knocked so that the surface of the coating member 21 is prevented from being dried and hardened. Even if the surface of the coating member 21 should be hardened, there would be a chance that the surface of the coating member 21 is recovered, though not fully satisfactorily, by slidably moving the coating member 21 in such a manner as to break the hardened coating liquid.

[0029] A modified structure of the second embodiment will now be described with reference to FIGS. 11 and 12. In this modification, the comb portions 25a are formed, in opposing relationship, on the ring-shaped portions 24 of the reduced-diameter portion 22 and the ring-shaped portions 24 are connected through two left and right bridge elements 26a of the reduced-diameter portion 22. Since the window holes 23 are located at the root areas of the comb portions 25a, hair can be dyed with the coating liquid 2 seeped out of the coating member 21 while combing the hair with the comb portions.

[0030] Another modified example of the second embodiment will now be described with reference to FIGS. 13 and 14. In this modification, the comb portions 25a are formed only on one side of the reduced-diameter portion 22. Long hair can be dyed while combing with the comb portions 25a and short hair can be dyed with the coating liquid 2 seeped out of that part of the coating member 21 which is exposed from the window holes 23 on the opposite side of the comb portions 25a.

[0031] Since the ring-shaped portions 25b are located on the outer periphery of the coating member 21, it never occurs that the coating member 21 contacts directly the head skin. Thus, the head skin is prevented from getting stained.

[0032] A third embodiment of the present invention will now be described with reference to FIG. 15. In the third embodiment, a rear cylindrical portion 17a formed on a rear part of the outlet member 17 is connected to a cylindrical protrusion 8 on the closure member 7 without a need of a provision of the liquid reservoir member 16 of the first embodiment. Since the coating liquid 2 discharged from the valve mechanism is supplied directly to the coating member 21, the coating liquid 2 is rapidly permeated into the coating member 21. Therefore, the tool can be used soon. This is especially effective when a coating liquid having a comparatively high viscosity is used.

[0033] Although the cylindrical portion 17a is formed on a rear part of the outlet member 17 and the cylindrical portion 17a is connected to the protrusion 8 in this embodiment, it is also accepted that the cylindrical member 17a is separately formed from the outlet member 17 and the protrusion 8 is connected to the outlet member 17.

[0034] As described hereinbefore, according to the present invention, there is provided a hair dyeing tool including a fluid storage chamber defined within a container body and adapted to store a coating liquid therein and a coating member having a comb member disposed forwardly of the container body, wherein the container body serves directly as the fluid storage chamber, a valve mechanism is disposed between the fluid storage chamber and the comb member, and a rear knock member disposed backwardly of the container body is actuated by the valve mechanism so that the coating liquid is ejected forwardly. Accordingly, an inexpensive hair dyeing tool can be offered to users without sacrificing the efficiency of the product.

## Claims

### 1. A hair dye applicator comprising:

a container body,  
a fluid storage chamber defined within the container body and adapted to store a hair dye liquid therein, and  
a coating member having a comb member disposed forwardly of said container body, wherein said container body serves directly as said fluid storage chamber, a valve mechanism is disposed between said fluid storage chamber and said comb member, and a rear knock member disposed backwardly of said container body is actuated by said valve mechanism so that the coating liquid is ejected forwardly.

2. A hair dye applicator according to claim 1, wherein said fluid storage chamber includes a liquid reservoir portion adapted to temporarily reserve the hair dye liquid so that the hair dye liquid is ejected from said fluid storage chamber by means of actuation of said rear knock member. 5
3. A hair dye applicator according to claim 1 or 2, wherein said coating member is provided on a peripheral surface thereof with a plurality of said comb members. 10
4. A hair dyeing tool according to claim 1, wherein said coating member includes a plurality of longitudinal grooves formed in a surface thereof and said coating member includes a plurality of comb members formed on a peripheral surface thereof. 15
5. A hair dye applicator according to claim 1 or 3, wherein said coating member is allowed to extend through an interior of a basal portion of said comb member and capable of seeping the coating liquid out of a region thereof which is exposed from said comb member. 20
6. A hair dye applicator according to any one of claims 1 through 4, wherein said coating member is provided in such a manner as to project from said liquid reservoir portion so that the hair dye liquid can permeate therein rapidly. 25 30
7. A hair dye applicator according to any one of claims 1 through 5, wherein said coating member can be slidably moved back and forth within said comb member by means of actuation of said valve mechanism. 35
8. A hair dye applicator according to claim 1, wherein the hair dye liquid is directly permeated into said coating member from said fluid storage chamber by means of actuation of said rear knock member. 40

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Fig. 1

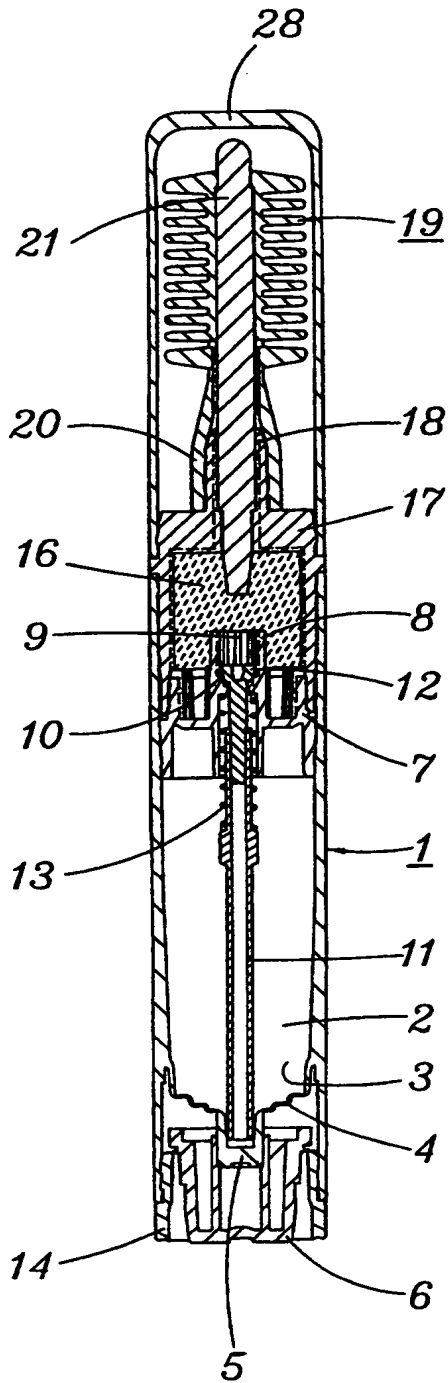


Fig. 3

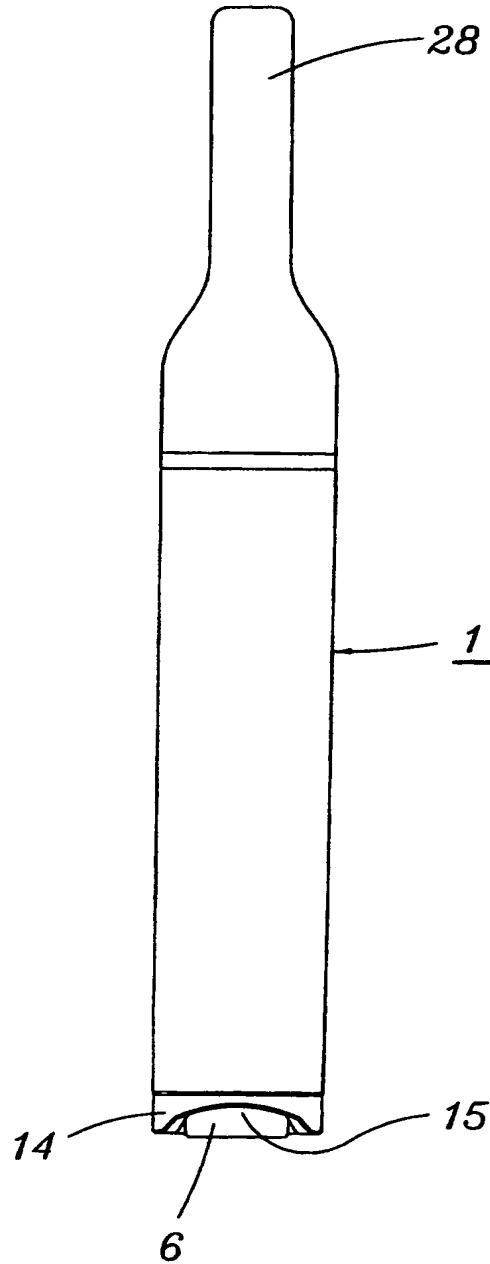


Fig.2

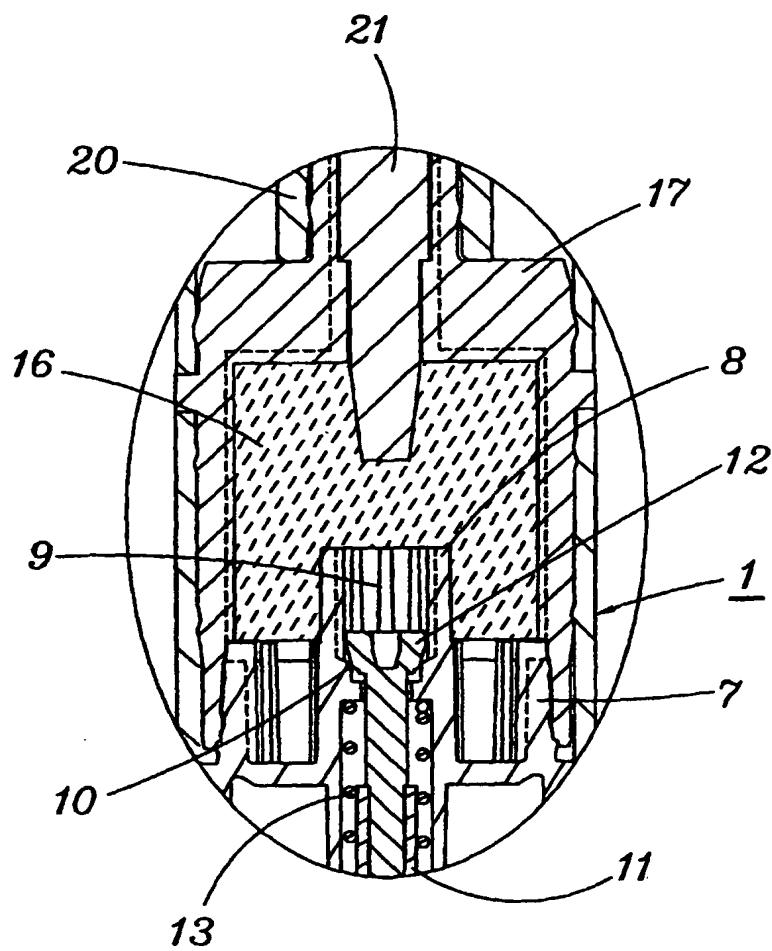


Fig.4

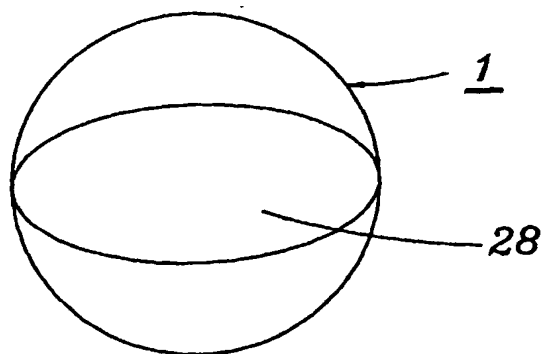


Fig.5

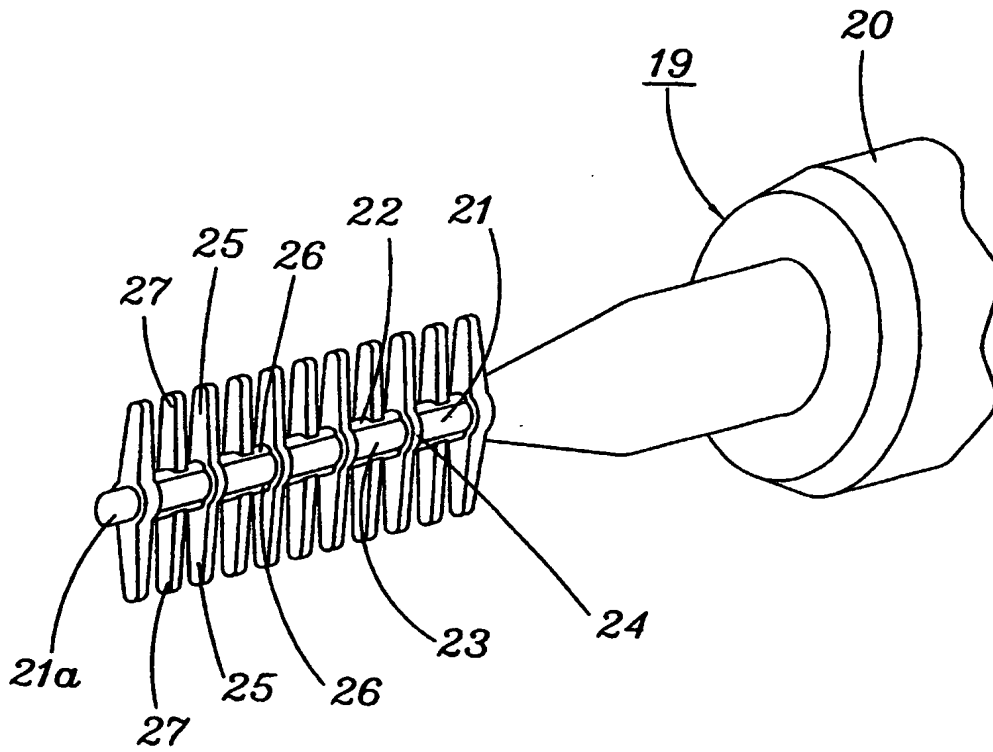


Fig.6

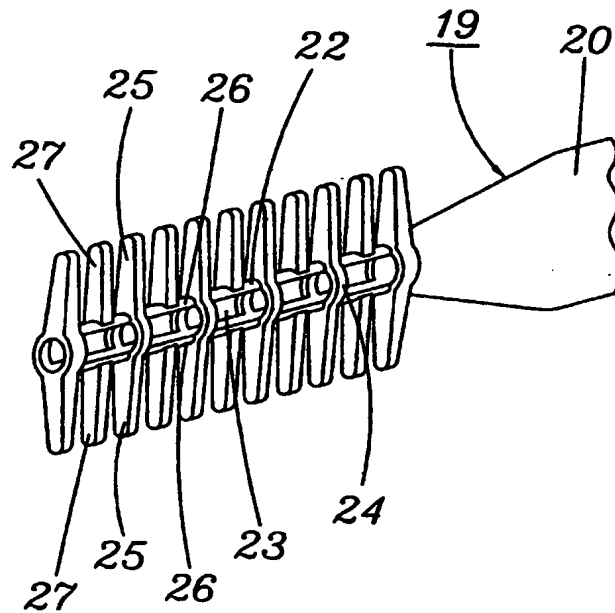


Fig. 7

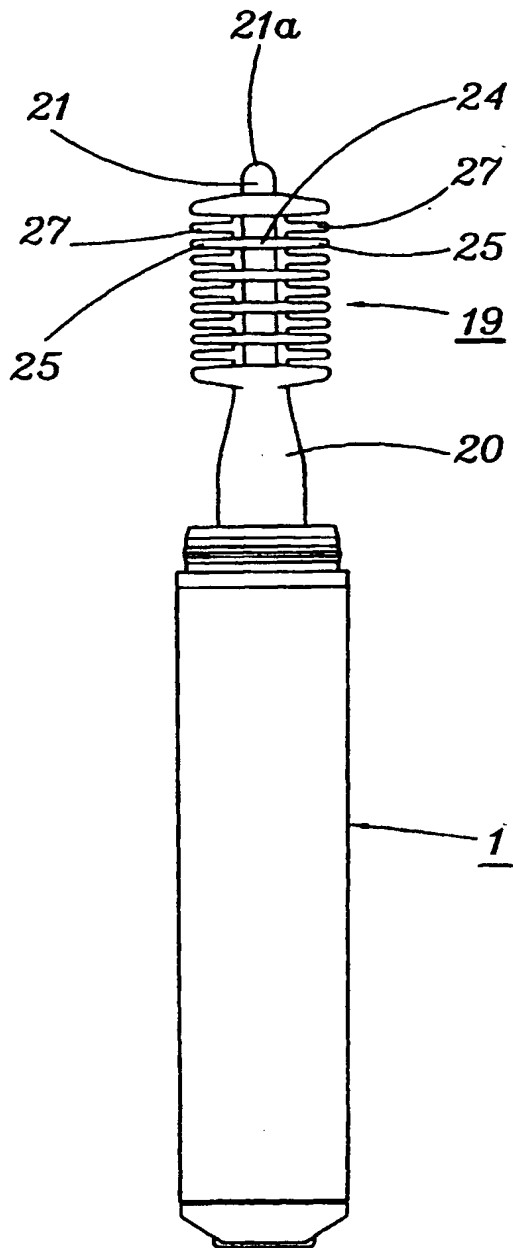


Fig. 8

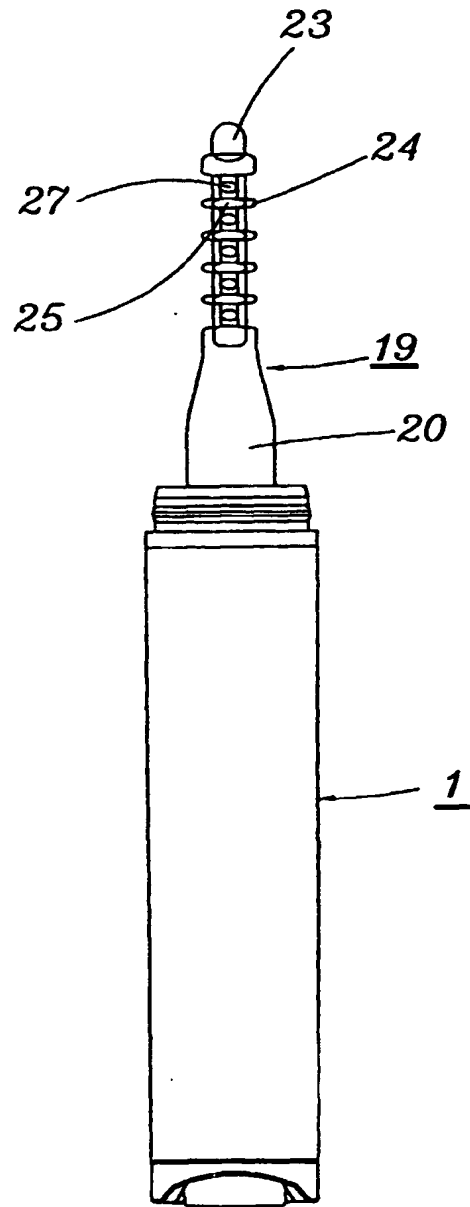


Fig. 9

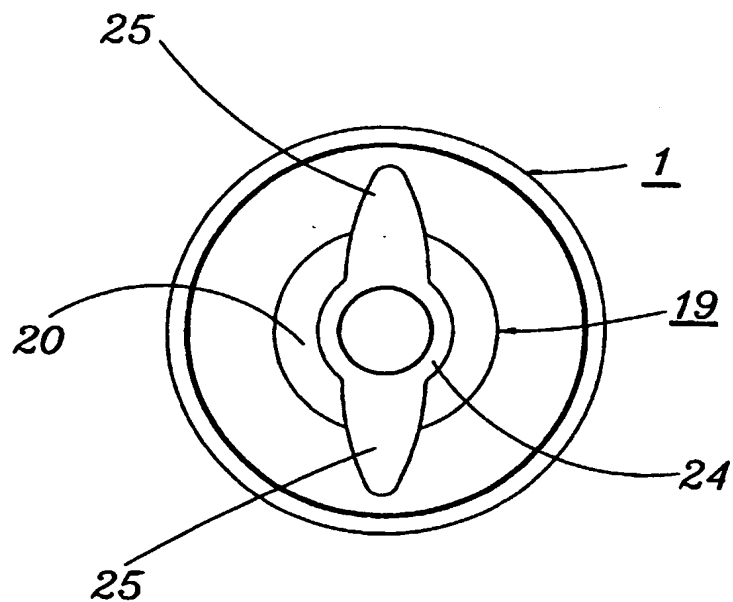


Fig. 12

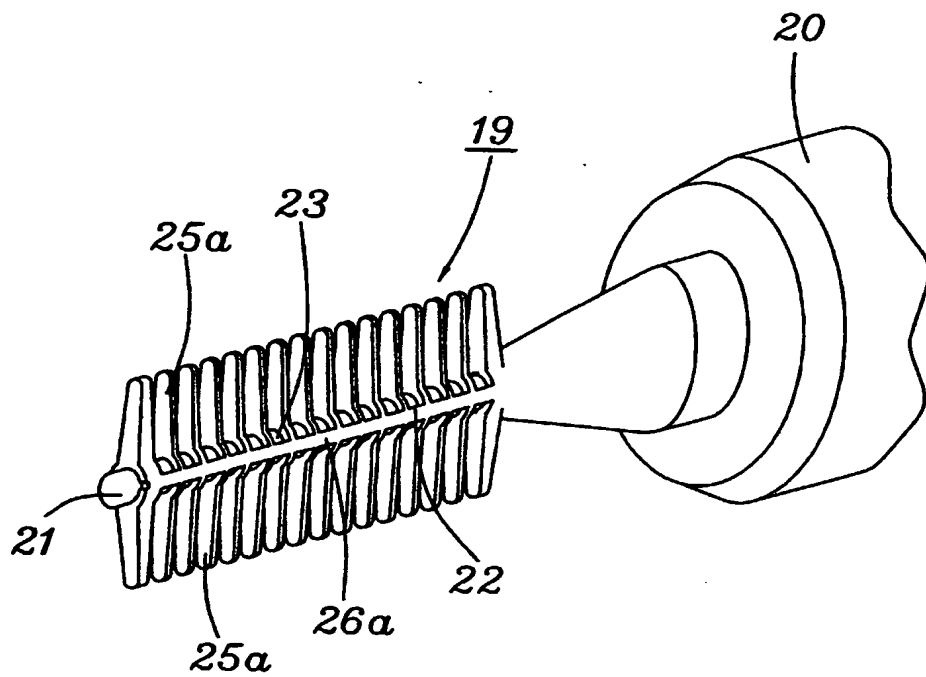


Fig.10

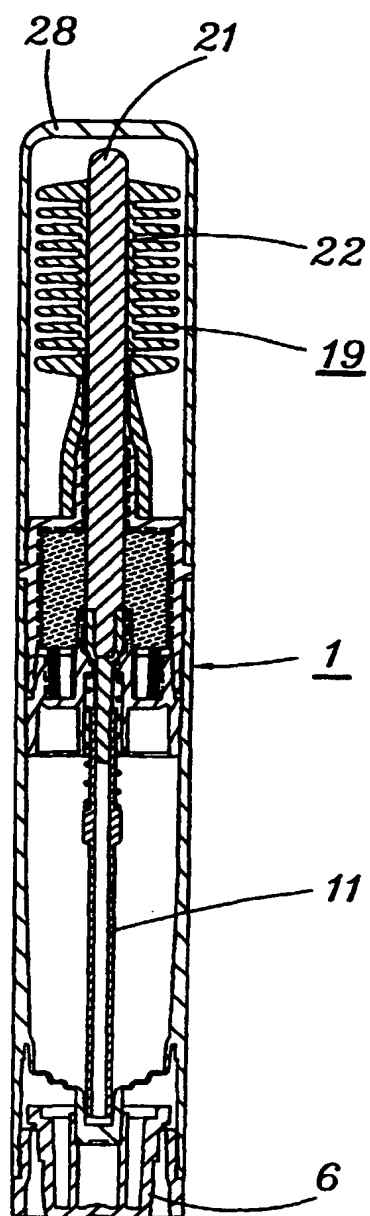
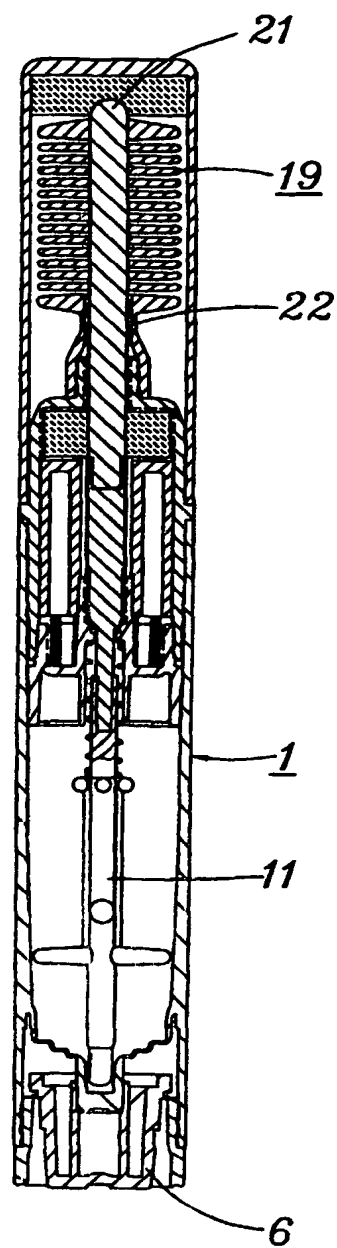
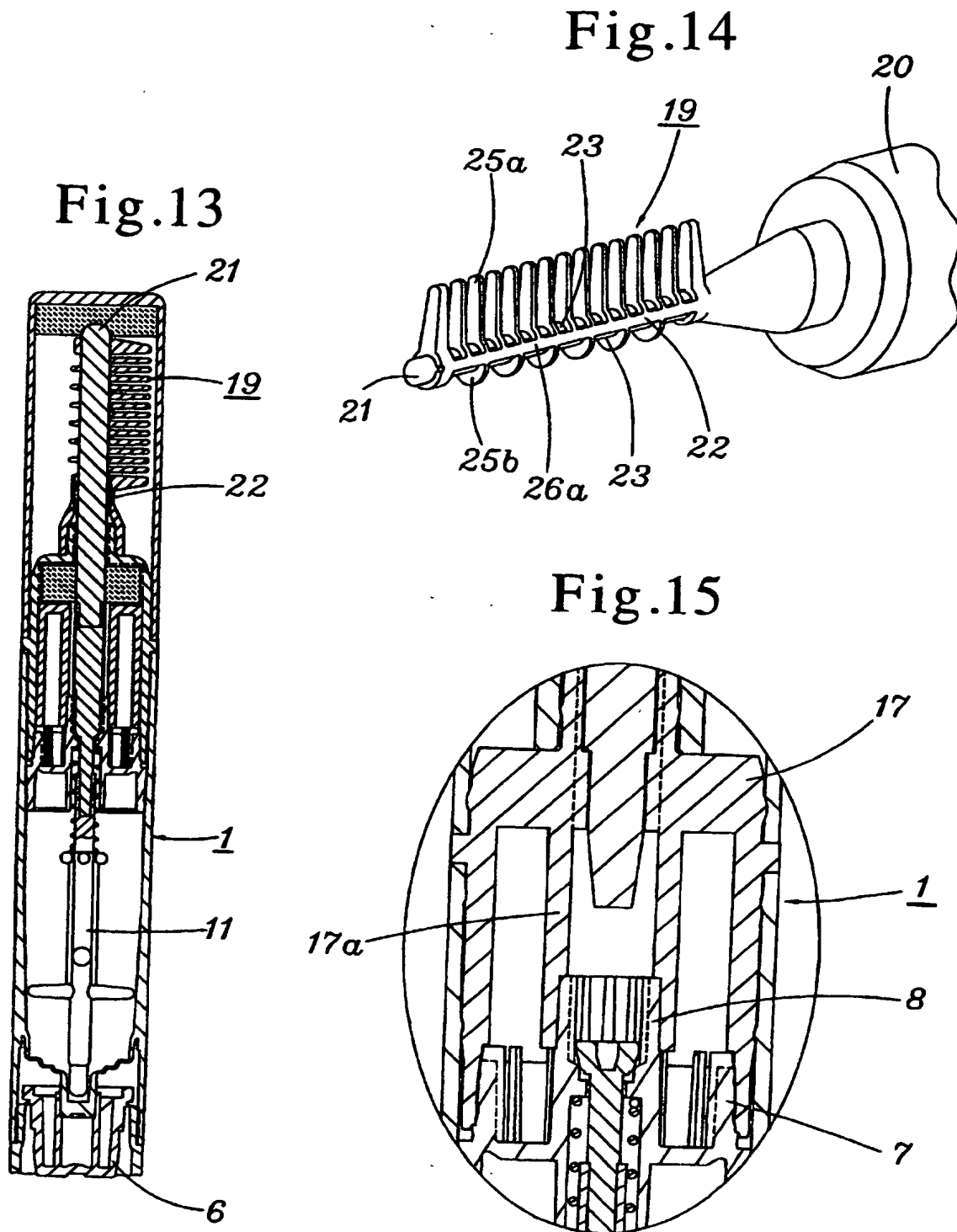


Fig.11





## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP99/02700

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> Int.Cl <sup>4</sup> A45D19/02		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) Int.Cl <sup>4</sup> A45D19/02, 34/04		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1926-1997 Toroku Jitsuyo Shinan Koho 1994-1999 Kokai Jitsuyo Shinan Koho 1971-1996		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP, 9-314029, A (Pentel Co., Ltd.), 9 December, 1997 (09. 12. 97), Full text ; Fig. 1 (Family: none)	1-8
A	JP, 8-70929, A (Hoyu Co., Ltd.), 19 March, 1996 (19. 03. 96) (Family: none)	1-8
A	JP, 8-38237, A (Shiseido Co., Ltd.), 13 February, 1996 (13. 02. 96) (Family: none)	1-8
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 2-41033 (Laid-open No. 4-303) (Hoyu Co., Ltd.), 6 January, 1992 (06. 01. 92), Page 9, lines 1 to 16 ; Fig. 5 (Family: none)	1, 3, 8
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed		"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
Date of the actual completion of the international search 6 August, 1999 (06. 08. 99)		Date of mailing of the international search report 24 August, 1999 (24. 08. 99)
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer
Facsimile No.		Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP99/02700

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 3-50423 (Laid-open No. 4-133732) (Mitsubishi Pencil Co., Ltd.), 11 December, 1992 (11. 12. 92), Full text ; Fig. 11 (Family: none)	1-8

Form PCT/ISA/210 (continuation of second sheet) (July 1992)